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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/756,715	01/13/2004	Seong-Ho Jeung	8021-196 (SS-19274-US)	2917
22150	7590	10/26/2005	EXAMINER	
F. CHAU & ASSOCIATES, LLC 130 WOODBURY ROAD WOODBURY, NY 11797			HUR, JUNG H	
			ART UNIT	PAPER NUMBER
			2824	

DATE MAILED: 10/26/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/756,715

Applicant(s)

JEUNG ET AL.

Examiner

Jung (John) Hur

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 15 August 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-26 is/are pending in the application.
- 4a) Of the above claim(s) 16-26 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-5, 8-11 and 15 is/are rejected.
- 7) ☒ Claim(s) 6, 7 and 12-14 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 13 January 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 1/13/04.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☒ Other: search history.

### **DETAILED ACTION**

1. Claims 1-26 are pending in the application.

#### ***Election/Restrictions***

2. Claims 16-26 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected invention, there being no allowable generic or linking claim.

Applicant timely traversed the restriction (election) requirement in the reply filed on 15 August 2005.

3. Applicant's election with traverse of Invention I (claims 1-15) in the reply filed on 15 August 2005 is acknowledged. The traversal is on the ground(s) that "[t]wo groups contain subject matters that are commonly classified in class 365" and therefore "simultaneous examination will not present an undue burden" (see page 2). This is not found persuasive because, as presented in the previous Office Action, although both inventions are commonly classified in class 365, they are distinct inventions and search required in one is not required for the other.

The requirement is still deemed proper and is therefore made FINAL.

#### ***Information Disclosure Statement***

4. Acknowledgment is made of applicant's Information Disclosure Statement (IDS) Form PTO-1449, filed 13 January 2004. The information disclosed therein has been considered.

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5. The listing of references in the specification is not a proper information disclosure statement. See for example page 1 of the specification. 37 CFR 1.98(b) requires a list of all patents, publications, or other information submitted for consideration by the Office, and MPEP § 609.04(a) states, "the list may not be incorporated into the specification but must be submitted in a separate paper." Therefore, unless the references have been cited by the examiner on form PTO-892, they have not been considered.

### *Specification*

6. Claims 1 and 9 are objected to because of the following informalities:

Claim 1, in line 10 of the claim, recites "the low-level voltages" which appears to lack antecedent basis. It will be understood as --low-level voltages-- (without "the").

Claim 9, in line 6 of the claim, recites "of an odd wordline" which appears to be inconsistent with the plural form of "of even wordlines" in line 8. It will be understood as --of odd wordlines-- (the plural form).

Appropriate correction is required.

### *Claim Rejections - 35 USC § 102*

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

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8. Claims 1, 2, 8-11 and 15 are rejected under 35 U.S.C. 102(b) as being anticipated by Houston (U.S. Pat. Appl. Pub. No. 2003/0007380).

Regarding claims 1, 2 and 8, Houston discloses a semiconductor device comprising: a memory cell array (an SRAM array; see paragraph [0017]) connected to one of a plurality of wordlines (14 in Fig. 1) and a plurality of bitline pairs (18a and 18b); a sense amplifier (inherent in SRAMs) amplifying data read from the memory cell array; a control circuit (inherent in SRAMs) controlling writing/reading of data to/from the memory cell array; a row decoder (inherent in SRAMs) decoding an address signal and outputting a decoded signal (for example, 38 in Fig. 1) to select one of the plurality of wordlines; a bitline-pair voltage setting circuit setting a voltage of at least one of the plurality of bitline pairs to a bitline test voltage in a test mode (i.e., setting the bitline voltages during a test operation or under a testing condition; see for example paragraphs [0009] and [0024]-[0026]); and a wordline driver (34 in Figs. 1, 2A and 2B) setting low-level voltages of the plurality of wordlines to a wordline test voltage in the test mode (i.e., a voltage above ground, determined by 60 or 66, when 62 is turned off; see also for example paragraphs [0024]-[0026]), wherein the wordline test voltage can be set to be different from the low-level voltage of the plurality of wordlines in a normal operation mode (i.e., different from the normal ground voltage 64);

wherein the low-level voltage of the wordlines in the normal operation mode (when 44 is high, in Figs. 1, 2A and 2B) is a ground voltage (64);

wherein the memory cell array comprises: a plurality of memory cells, wherein each memory cell is connected to one of the plurality of wordlines and the plurality of bitline pairs (see Fig. 1 and paragraph [0017]).

Regarding claims 9-11 and 15, Houston discloses a semiconductor device comprising: a memory cell array including a plurality of memory cells (SRAM cells; see paragraph [0017]), each memory cell connected to one of a plurality of wordlines (14 in Fig. 1) and a plurality of bitline pairs (18a and 18b); a row decoder (inherent in SRAMs) decoding an address signal and outputs a decoded signal (for example, 38 in Fig. 1) to select one of the plurality of wordlines; an odd wordline driver (34 in Fig. 1 for odd rows) setting low-level voltages of odd wordlines to an odd low-level voltage in a test mode (Figs. 1, 2A and 2B, as applied to the odd wordlines; see also for example paragraphs [0024]-[0026]); and an even wordline driver (34 in Fig. 1 for even rows) setting low-level voltages of even wordlines to an even low-level voltage in the test mode (Figs. 1, 2A and 2B, as applied to the even wordlines; see also for example paragraphs [0024]-[0026]), wherein both the odd low-level voltage and the even low-level voltage can be set to be different from the low-level voltages of the plurality of wordlines set in a normal operation mode (i.e., both the odd and even low-level voltages are different from the normal ground voltage of 64);

further comprising a bitline pair voltage setting circuit, which sets the voltage of at least one of the plurality of bitline pairs to a bitline test voltage level (i.e., setting the bitline voltages during a test operation or under a testing condition; see for example paragraphs [0009] and [0024]-[0026]);

wherein the odd wordlines alternate with the even wordlines (i.e., alternating odd and even rows of Fig. 1 in the array);

wherein the semiconductor device is a static random access memory (SRAM) (see Fig. 1 and paragraph [0017]).

***Claim Rejections - 35 USC § 103***

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 3-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Houston (U.S. Pat. Appl. Pub. No. 2003/0007380) in view of Herr et al. (U.S. Pat. No. 5,687,178).

Regarding claim 3, Houston discloses a semiconductor device as in claim 2, and further discloses a ground voltage terminal which receives the ground voltage (inherent in the memory integrated circuit, to receive the external ground potential).

However, Houston does not disclose a wordline test voltage terminal receiving the wordline test voltage, wherein the wordline test voltage terminal is separate from the ground voltage terminal.

Herr discloses a wordline test voltage terminal (44 in Figs. 3 and 4) receiving a wordline test voltage (VIN1), wherein the wordline test voltage terminal would be separate from a ground voltage terminal (and also different from a supply voltage terminal for VDD; see Figs. 3 and 4).

Since Herr discloses a means for switching the supply voltage of wordline drivers (see Herr Figs. 4 and 6), it would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the device of Houston, such that the wordline low-level

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test voltage of Houston would be provided through a terminal separate from the ground voltage terminal (similar to Fig. 4 of Herr, but modified to switch the ground voltage instead of the supply voltage), as an equivalent alternative means for limiting the wordline voltage swing under test conditions (see for example Houston, paragraphs [0009] and [0025]), for the purpose of providing a greater flexibility in setting a desired level of the wordline low-level test voltage after packaging (see for example Herr, column 8, line 65 through column 9, lines 15).

Regarding claims 4 and 5, the above combination of Houston and Herr further comprises a ground voltage connection unit connected to the ground voltage terminal (within 42 in Figs. 3 and 4 of Herr, modified for the ground voltage, in the above combination; i.e., to connect the ground voltage to the wordline driver); and a wordline test voltage connection unit (within 42 in Figs. 3 and 4 of Herr, modified for the ground voltage, in the above combination; i.e., to connect the test voltage to the wordline driver) connected to the wordline test voltage terminal; or

a ground voltage connection unit (including 42 in Figs. 3 and 4 of Herr, modified for the ground voltage, in the above combination) connected to the ground voltage terminal (as modified for the ground voltage in the above combination) and the wordline test voltage terminal (44) upon packaging of the semiconductor device (see column 9, lines 5-15).

***Allowable Subject Matter***

11. Claims 6, 7 and 12-14 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.



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The following is a statement of reasons for the indication of allowable subject matter:

Regarding claim 6, the prior arts of record do not disclose or suggest a semiconductor device as recited in claim 6, and particularly, the odd wordline driver and the even wordline driver being able to independently set the low-level voltages of the odd wordline and the even wordline, respectively, in the test mode.

Regarding claim 12, the prior arts of record do not disclose or suggest a semiconductor device as recited in claim 12, and particularly, the odd low-level voltage terminal and the even low-level voltage terminal are separate from a ground voltage terminal, which receives the ground voltage.

### *Conclusion*

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

O'Toole et al. (U.S. Pat. No. 4,418,403); Butler et al. (U.S. Pat. No. 5,265,056); Hidaka et al. (U.S. Pat. No. 5,687,123); Wendell (U.S. Pat. No. 5,920,517); Wendell (U.S. Pat. No. 5,930,185); Tsukude (U.S. Pat. No. 6,205,067)

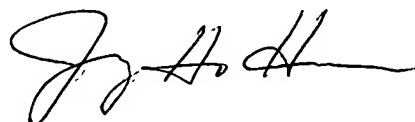
13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jung (John) Hur whose telephone number is (571) 272-1870.

The examiner can normally be reached on M-F 6:30 AM - 3:00 PM.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Elms can be reached on (571) 272-1869. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

 10/25/05

Jung (John) Hur  
Patent Examiner  
Art Unit 2824

jhh